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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/410,368	09/30/1999	JOHN R. HAVENS	244/006	6760

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EXAMINER	
LIN, JERRY	
ART UNIT	**PAPER NUMBER**
1631	

DATE MAILED: 06/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/410,368	HAVENS ET AL.	
	Examiner	Art Unit	
	Jerry Lin	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,7-9,13,14,16,17,28-32,34,36,37,67,72,73,78-80,87,88 and 90-93* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7-9,13,14,16,17,28-32,34,36,37,67,72,73,78-80,87,88 and 90-93* is/are rejected.

7)☒ Claim(s) *1 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1 page*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicants' arguments and amendments, filed January 1, 2006, have been fully considered and they are deemed to be persuasive. However, in light of new art, the following rejections are newly applied. They constitute the complete set presently being applied to the instant application.

Election/Restrictions

1. Newly amended claims 1 and 14, and newly submitted claim 92 is directed to include species that are independent or distinct from the invention originally claimed for the following reasons: Claims 1, 14 and 92 include new groups for R. Each group is distinct, because each group creates a different P-X-R formula. Thus each R group creates a different independent and distinct species. Furthermore, since each R group is a different chemical entity, each R group would require a different search.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, the R groups ketals, imines, TBOC, FMOC, trityl, trifluoracetamide are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The examination for claims 1, 14, and 92 will be limited to acetals and esters.

Claim Objections

2. Claim 1 is objected to because of the following informalities: the word "at" is repeated in line 21 of the instant claim. Appropriate correction is required.

Claim 14 is objected to because of the following informalities: the word "at" is repeated in lines 16-17 of the instant claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 28-32, 34, 36-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 28 is unclear because the instant claims states that the pH change may result from a change of buffer or a change in electronic potential, and the claims ends with the step of changing electronic potential. It is unclear if the step of changing electronic potential is still required if the practitioner chooses to change the pH by changing the buffer.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 7-9, 13-14, 16, 17, 28-32, 34, 37, 72, 73, 78-80, 87-88, and 92 are rejected under 35 U.S.C. 102(e) as being anticipated by Sosnowski et al. (US 2003/0190632 A1).

The instant claims are drawn to a microarray device that includes a microelectrode covered by a permeation that is attached to an X group, which is attached to an R group that is activated by a pH change caused by an electric current before the R group binds to a biomolecule.

Regarding claim 1 and 13, Sosnowski et al. teach creating a microarray comprising a plurality of microlocations (page 4, paragraph 0042); each microlocation comprises an underlying working microelectrode on a substrate (page 6, paragraph 0056; page paragraph 0124); which are covered by a permeation layer (page 4, paragraph 0043); which comprises a polymerizable moiety (page 14, paragraphs 0179-0184); a linking moiety X (primary amine or covalent bond) (page 14, paragraph 0183); and a R group (succinimidyl ester) which is activated by running an electronic current which would cause a change in the pH in the overlaying solution (page 25, paragraphs 0300, 0304) before reacting with a biomolecule (DNA) (page 25, paragraph 0304).

Regarding claims 7-9, Sosnowski et al. teach wherein the P is covalently attached to other PXR groups and where the P moieties are the same (page 14, paragraphs 0179-0184).

Regarding claim 14, 78, 79, and 80 Sosnowski et al. teach creating a microarray comprising a plurality of microlocations (page 4, paragraph 0042); each microlocation comprises an underlying working microelectrode on a substrate (page 6, paragraph

0056; page paragraph 0124); which are covered by a permeation layer (page 4, paragraph 0043); which comprises a polymerizable moiety (page 14, paragraphs 0179-0184); a linking moiety X (primary amine) (page 14, paragraph 0183); and a R group (succinimidyl ester) which is activated by running an electronic current which would cause a change in the pH in the overlaying solution (page 25, paragraphs 0300, 0304) before reacting with a biomolecule (DNA) (page 25, paragraph 0304); wherein the first and second PXR groups may be the same or different (page 14, paragraph 0179-0184); wherein the P is covalently attached to a permeation layer matrix (page 14, paragraph 0179-0184); wherein the P moieties of the second PXR groups are covalently attached to one other P moieties to from a polymer (page 14, paragraph 0179-0184).

Regarding claim 16, 17, and 34, Sosnowski et al. teach wherein the R are the same for the first and second PXR groups (page 25, paragraph 0300, 0304); and wherein the P requires activation prior to participating in a polymerization reaction (pages 14-15, paragraphs 0184-0185).

Regarding claim 28, 32, and 92, Sosnowski et al. teach creating a microarray comprising a plurality of microlocations (page 4, paragraph 0042); each microlocation comprises an underlying working microelectrode on a substrate (page 6, paragraph 0056; page paragraph 0124); which are covered by a permeation layer P (page 4, paragraph 0043); which comprises a polymerizable moiety (page 14, paragraphs 0179-0184) where the P requires chemical activation (pages 14-15, paragraphs 0184-0185); a linking moiety X (primary amine) (page 14, paragraph 0183); and a R group (succinimidyl ester) which is activated by running an electronic current which would

cause a change in the pH in the overlaying solution (page 25, paragraphs 0300, 0304) before reacting with a biomolecule (DNA) (page 25, paragraph 0304); wherein the pH change is produced by electro potential or by a new buffer (page 25, paragraph 0300-0304) wherein the electronic potential used is at a current density between 50 nA/5000μm^2 and 5 μA/5000μm^2 for a time period between 30-600 seconds (page 25, paragraphs 0300-0304).

Regarding claim 29, 27, 88, Sosnowski et al. disclose wherein the permeation layer is an acrylamide, etc. (pages 14-15, paragraph 0179-0185).

Regarding claim 30, Sosnowski et al. disclose wherein the biomolecule are derivatized (page 20, paragraph 0259).

Regarding claims 31 and 72, Sosnowski et al. teach wherein the P group is a vinyl (hydrogel, which uses acrylates that contain vinyl groups) (page 12, paragraph 0159).

Regarding claims 67 and 73, Sosnowski et al. teach wherein the P group includes amine moieties (page 14, paragraphs 0179-0184).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 36, 90, 91, and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sosnowski et al. (US 2003/0190632 A1) in view of Blackburn et al. (US 6,767,816).

The instant claims are drawn to a microarray device that includes a microelectrode covered by a permeation that is attached to an X group which is attached to a thioester moiety.

Sosnowski et al. is applied as above.

Sosnowski et al. do not teach using thioesters in the R group.

Blackburn et al. teach wherein the R group includes thioesters (column 27, lines 1-10, 35-43; column 28, lines 5-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the devices of Sosnowski et al. and Blackburn et al. Blackburn et al. teach that increased solubility is desired with an oligmer that is attached to an electrode (column 26, lines 50-65). Sosnowski et al. also teach a method wherein biomolecules are also attached to an electrode (abstract). Thus one of ordinary skill in the art making Sosnowski et al.'s device also be motivated to ensure that the attached oligmer have increase solubility as advised by Blackburn et al. Blackburn et al. suggest some suitable R groups that increase solubility (column 27, lines 1-10). One of ordinary skill in the art would use the R groups (including thioesters) suggested by Blackburn et al. to create oligmers with increased solubility in Sosnowski et al.'s method.

9. Claims 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sosnowski et al. (US 2003/0190632 A1) in view of Bryan et al. (US 6,458,547).

The instant claims are drawn to a microarray device that includes a microelectrode covered by a permeation that is attached to an X group, which is attached to an acetal moiety.

Sosnowski et al. is applied as above.

Sosnowski et al. do not teach using acetals in the R group.

Bryan et al. teach wherein the R group includes acetals (column 13, line 52-column 14, line 13).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the devices of Sosnowski et al. and Bryan et al. Bryan et al. teach different methods of attaching different biomolecules to an array that includes a permeation layer over an electrode (abstract, column 13, line 52-column 13, line 13). Sosnowski et al. teach that a variety of biomolecules may be used on their array (page 5, paragraph 0050). However Sosnowski et al. do not specifically teach which method or functional groups are best suited for attaching certain biomolecules to their array. Thus one of ordinary skill in the art would be motivated to find how to attach a biomolecule of interest to the device of Sosnowski et al. Since Bryan et al. teach different methods of attaching different biomoleulce to an array, one of ordinary skill in the art would be motivated to used Bryan et al.'s method on Sosnowski et al.'s device to attach different biomolecules to the array.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Lin whose telephone number is (571) 272-2561. The examiner can normally be reached on 10:00am-6:30pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang, can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Representatives are available to answer your questions daily from 6 am to midnight (EST). When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system

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MICHAEL BORIN, PH.D
PRIMARY EXAMINER

JL